AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Canceled)

2. (Currently Amended) The ~~method~~ system of claim [[1]] 27 wherein the processor causes the further execution of ~~further comprising~~ the step of associating a cost and a revenue to each valid product configuration.

3. (Currently Amended) The ~~method~~ system of claim 2 wherein the cost associated with each valid product configuration is comprised of a plurality of per option costs.

4. (Canceled)

5. (Canceled)

6. (Currently Amended) The ~~method~~ system of claim [[1]] 27 wherein the desired objective is to maximize the profit of a manufacturer or retailer of the product.

7. (Currently Amended) The ~~method~~ system of claim [[1]] 27 wherein the desired objective is to minimize the costs of a manufacturer of the product.

8. (Currently Amended) The ~~method~~ system of claim [[1]] 27 wherein the desired objective is to maximize coverage of customer demand for the product.

9. (Currently Amended) The ~~method~~ system of claim [[1]] 27 wherein the optimization model is defined such that the number of product configurations in the optimum subset of valid product configurations is fixed.

10. (Currently Amended) The ~~method~~ system of claim [[1]] 27 wherein the optimization model is defined such that the number of product configurations in the optimum subset of valid product configurations is variable.

11. (Currently Amended) The ~~method~~ system of claim [[1]] 27 wherein the ~~dimensions of the ordered sets~~ multi-dimensional feature arrays represent the ~~selectable~~ features in a fixed and non-modifiable order.

12. (Currently Amended) The ~~method~~ system of claim [[1]] 27 wherein the mix-and-match rules identify invalid or impermissible product configurations.

13. (Currently Amended) The ~~method~~ system of claim [[1]] 27 wherein the step of applying mix-and-match rules to the multi-dimensional feature arrays ~~ordered sets of dimensions~~ to identify the valid product configurations further comprises the step of conducting fast enumeration on partial configurations.

14. (Currently Amended) The ~~method~~ system of claim [[1]] 27 wherein the processor causes further execution of ~~further comprising~~ the step of defining configuration neighborhoods based on a relation structure, wherein the configuration neighborhoods identify at least one valid product configuration captured by another valid product configuration.

15. (Currently Amended) The ~~method~~ system of claim 14 wherein the relation structure is an upgrade relation that identifies at least one ~~selectable~~ feature having an option that is

upgradeable for no additional cost to a customer of the product configuration having the upgrade option.

16. (Currently Amended) The ~~method~~ system of claim 14 wherein the relation structure is a convert relation that identifies at least one ~~selectable~~ feature having an option that is convertible to another option at a respective conversion cost.

17. (Currently Amended) The ~~method~~ system of claim 14 wherein the relation structure is an acceptance relation that identifies at least one ~~selectable~~ feature having an option that is acceptable to a consumer desiring a different option at a respective acceptance value.

18. (Currently Amended) The ~~method~~ system of claim 17 wherein the acceptance value is a probability that the customer will accept the acceptance option instead of the different option.

19. (Currently Amended) The ~~method~~ system of claim 14 wherein the relation structure is an acceptance relation that identifies a plurality of ~~selectable~~ features, each feature having a respective option that is acceptable to a consumer desiring respective different options at a respective acceptance value, the acceptance value being the product of the probabilities that the customer will accept each respective different option.

20. (Currently Amended) The ~~method~~ system of claim 14 wherein the relation structure identifies at least one valid product configuration that captures another valid product configuration through an upgrade, conversion, or acceptance of at least one option.

21. (Currently Amended) The ~~method~~ system of claim [[1]] 27 wherein the product is a manufactured good.

22. (Currently Amended) The ~~method~~ <u>system</u> of claim [[1]] <u>27</u> wherein the product is a service.

23. (Canceled)

24. (Currently Amended) A computerized system for generating an optimum subset of valid product configurations associated with a product, comprising:

a configuration generator for receiving product configuration data, the product configuration data representative of all possible product configurations, each product configuration defined by a plurality of options selected from a plurality of features, each feature having a plurality of options, the configuration generator applying mix-and-match rules to identify a set of valid product configurations from all possible product configurations, the configuration generator further representing each of the valid product configurations as an ordered array in a valid product configuration space;

a demand simulator for receiving historical demand data associated with all possible product configurations and calculating relative demand for each of the valid product configurations based on [[the]] historical demand data associated with each option of each feature of the valid product configurations;

a cost calculator for calculating and associating a cost of manufacture for each of the valid product configurations;

a revenue calculator for calculating and associating a revenue potential for each of the valid product configurations;

an objective-based modeler for defining an optimization model and for receiving product configuration information from the configuration generator, the demand simulator, the cost calculator, and the revenue calculator; and

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an optimization engine for solving the optimization model based on the received product configuration information and generating the optimum subset of valid product configurations from the set of valid production configurations <u>in the valid product configuration space,</u> and for generating costs, revenue, and parts needed for the optimum subset of valid product configurations.

25. (Currently Amended) The ~~method~~ <u>system</u> of claim [[1]] <u>27</u> wherein the generated optimum subset of valid product configurations comprises the product configurations that a manufacturer should manufacture to meet the desired objective.

26. (Currently Amended) The ~~method~~ <u>system</u> of claim [[1]] <u>27</u> wherein the generated optimum subset of valid product configurations comprises the product configurations that a retailer should offer for sale to customers to meet the desired objective.

27. (New) A computerized system for generating an optimum subset of product configurations from a plurality of possible product configurations associated with a product, wherein the product includes a plurality of features, each feature including a plurality of selectable options, comprising:

a processor;

a database for storing product configuration data and historical demand data associated with the plurality of possible product configurations, wherein each product configuration includes a plurality of options selected from the plurality of features; and

a computer readable medium that is usable by the processor and is operatively coupled to the database, the medium having stored thereon a sequence of instructions that when executed by the processor causes the execution of the steps of:

receiving product configuration data from the database representative of the plurality of possible product configurations;

based on the received product configuration data, representing each product configuration in the plurality of possible product configurations as a multi-dimensional feature array in a possible product configuration space, wherein each array identifies the options associated with its respective product configuration;

applying mix-and-match rules to the multi-dimensional feature arrays in the possible product configuration space to define a plurality of

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valid multi-dimensional feature arrays in a valid product configuration space representing valid product configurations as a subset of the plurality of possible product configurations;

receiving historical demand data from the database for the valid product configurations, the historical demand data including a demand value for each respective option of each respective feature associated with each valid product configuration;

analyzing the valid product configuration space via an optimization model to generate an optimum subset of valid product configurations from the plurality of valid product configurations based on a desired objective and the received demand values associated with each of the valid product configurations, wherein each valid multi-dimensional feature array in the valid product configuration space is analyzed prior to generating the optimum subset of valid product configurations; and

outputting the generated optimum subset of valid product configurations that satisfy the desired objective.

28. (New) The system of claim 27 wherein the possible product configuration space comprises an n-dimensional space, wherein n equals the number of features in the plurality of features.

29. (New) The system of claim 27 wherein the valid product configuration space comprises an n-dimensional space, wherein n equals the number of features in the plurality of features.

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30. (New) The system of claim 27 wherein the historical demand data comprises data based on previous sales of the product.

31. (New) The system of claim 27 wherein the historical demand data comprises data based on forecasted future sales of the product.

32. (New) A computerized system for generating an optimum subset of product configurations from a plurality of possible product configurations associated with a product capable of being manufactured by a company, wherein the product includes a plurality of features, each feature including a plurality of selectable options, comprising:

a processor;

a database for storing product configuration data and historical demand data associated with the plurality of possible product configurations, wherein each product configuration includes a plurality of options selected from the plurality of features; and

a computer readable medium that is usable by the processor and is operatively coupled to the database, the medium having stored thereon a sequence of instructions that when executed by the processor causes the execution of the steps of:

receiving product configuration data from the database associated with the plurality of possible product configurations, the product configuration data including a cost to manufacture by the company and a revenue value to the company for each product configuration in the plurality of possible product configurations;

based on the received product configuration data, representing each product configuration in the plurality of possible product configurations as a multi-dimensional feature array in a possible product configuration space, wherein each array identifies the options associated with its respective product configuration;

applying mix-and-match rules to the multi-dimensional feature
arrays in the possible product configuration space to define a plurality of
valid multi-dimensional feature arrays in a valid product configuration
space representing valid product configurations as a subset of the plurality
of possible product configurations;

receiving historical demand data from the database for the valid
product configurations, the historical demand data including a demand
value for each respective option of each respective feature associated with
each valid product configuration;

analyzing the valid product configuration space via an optimization
model to generate an optimum subset of valid product configurations from
the plurality of valid product configurations based on: (i) a desired
objective of the company, (ii) the cost to manufacture of each valid
product configuration, (iii) the revenue value of each valid product
configuration, and (iv) the received demand values associated with the
options of each valid product configuration, wherein each valid multi-
dimensional feature array in the valid product configuration space is
analyzed simultaneously before generating the optimum subset of valid
product configurations; and

storing the generated optimum subset of valid product
configurations in the database that satisfy the desired objective,

whereby the generated optimum subset of valid product configurations are
subsequently manufactured by the company.

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